

Docket No.: 50212-180

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Wataru SAKURAI, et al.

Serial No.:

(Divisional of Serial No. : 09/509,953)

Group Art Unit:

Filed: January 30, 2001

Examiner:

For: FERRULE FOR OPTICAL CONNECTOR, MOLD FOR FERRULE, METHOD OF
MANUFACTURING FERRULE FOR OPTICAL CONNECTION, AND METHOD OF
TESTING FERRULE FOR OPTICAL CONNECTOR

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, DC 20231

Sir:

Entry of the following Preliminary Amendment and Remarks, prior to examination, is
respectfully solicited.

IN THE SPECIFICATION:

Page 19, line 7, change "holes 21" to --holes 20--.

Page 37, line 14, change "the third mold unit 110" to --the fourth mold unit 111--.

line 17, change "the third mold unit 120" to --the fourth mold unit 111--.

Page 38, line 25, change "accommodating hole forming pins 116" to --through holes 116-

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Page 54, lines 6 to 13, delete "That is, the coupling precision of optical connectors...that
the prior art does not have."

IN THE CLAIMS:

Please cancel Claims 1 through 14 in their entirety without prejudice or disclaimer of the subject matter thereof.

Please amend claims 15, 16, 17, 18, 20, 21, 25 and 26 as follows:

15. (Amended) A mold for providing [said] an optical connector ferrule comprising:
a mating surface made of resin;
an optical fiber accomodating hole having an inner surface and one end portion, said
inner surface extending along a predetermined axis and being made of the resin, and one end
portion reaching said mating surface;
a first guide projection having proximal and distal end portions, said first guide projection
continuously extending from said mating surface along the predetermined axis, and said first
guide projection being made of the resin; and
a guide engaging portion continuously extending from said mating surface along the
predetermined axis, said guide engaging portion made of the resin, [according to claim 1] the
mold comprising:

first, second, third, and fourth mold units for defining a cavity for providing said ferrule;
said first and second mold units, combined with each other to define the cavity, providing
opening portions toward the predetermined axis so as to provide a housing portion for housing
said third and fourth mold units;

said third and fourth mold units being housed in the housing portion so as to be movable
along th e predetermined axis with respect to said combined first and second mold units; and

said third mold unit including a guide projection forming portion, at least one pin, and an engaging portion forming portion, said guide projection forming portion having an inner surface and a bottom surface and extending along the predetermined axis, said at least one pin extending along the predetermined axis, and said engaging portion forming portion being provided to form said engaging portion and extending along the predetermined axis.

16. (Amended) A mold for providing [said] an optical connector ferrule comprising:
a mating surface made of resin;
an optical fiber accomodating hole having an inner surface and one end portion, said inner surface extending along a predetermined axis and being made of the resin, and one end portion reaching said mating surface;
a first guide projection having proximal and distal end portions, said first guide projection continuously extending from said mating surface along the predetermined axis, and said first guide projection being made of the resin; and
a guide engaging portion continuously extending from said mating surface along the predetermined axis, said guide engaging portion made of the resin, wherein said guide engaging portion includes a second guide projection having proximal and distal end portions, said second guide projection continuously extending from said mating surface along the predetermined axis, and said second guide projection being made of the resin, [according to claim 2] the mold comprising:

first, second, third, and fourth mold units for defining a cavity for providing said ferrule;
said first and second mold units, combined with each other to define the cavity, and

providing opening portions toward the predetermined axis so as to provide a housing portion for housing said third and fourth mold units;

said third and fourth mold units being housed in the housing portion so as to be movable along the predetermined axis with respect to said combined first and second mold units; and

said third mold unit including a pair of guide projection forming portions and at least one pin, each guide projection forming portion extending along the predetermined axis and having an inner surface and a bottom surface, and said at least one pin extending along the predetermined axis.

17. (Amended) A mold for providing [said] an optical connector ferrule comprising:
a mating surface made of resin;
an optical fiber accomodating hole having an inner surface and one end portion, said inner surface extending along a predetermined axis and being made of the resin, and one end portion reaching said mating surface;
a first guide projection having proximal and distal end portions, said first guide projection continuously extending from said mating surface along the predetermined axis, and said first guide projection being made of the resin; and
a guide engaging portion continuously extending from said mating surface along the predetermined axis, said guide engaging portion made of the resin, wherein said guide engaging portion includes a guide hole having an opening portion, a distal end portion, and an inner surface, said opening portion being provided on said mating surface, said inner surface being made of the resin, and said guide hole extending along the predetermined axis, [according to

claim 5] the mold comprising:

first, second, third, and fourth mold units for defining a cavity for providing said ferrule;
said first and second mold units, combined with each other to define the cavity, providing opening portions toward the predetermined axis so as to provide a housing portion for housing said third and fourth mold units;

said third and fourth mold units being housed in the housing portion so as to be movable along the predetermined axis with respect to said combined first and second mold units; and

said third mold unit including a guide projection forming portion, a projection, and at least one pin, said guide projection forming portion having an inner surface and a bottom surface and extending along the predetermined axis, said projection having a side surface and extending along the predetermined axis, and said at least one pin extending along the predetermined axis.

Claim 18, line 1, delete "or 17".

Claim 20, line 1, delete "any one of claims 15 to 19" and insert claim --15--.

Claim 21, line 1, delete "or 17".

25. (Amended) A method of inspecting a position of a fiber accommodating hole of [said] an optical connector ferrule comprising:

a mating surface made of resin;

an optical fiber accommodating hole having an inner surface and one end portion, said

inner surface extending along a predetermined axis and being made of the resin, and one end portion reaching said mating surface;

a first guide projection having proximal and distal end portions, said first guide projection continuously extending from said mating surface along the predetermined axis, and said first guide projection being made of the resin; and

a guide engaging portion continuously extending from said mating surface along the predetermined axis, said guide engaging portion made of the resin, wherein said guide engaging portion includes a second guide projection having proximal and distal end portions, said second guide projection continuously extending from said mating surface along the predetermined axis, and said second guide projection being made of the resin, [according to claim 2] with respect to the first guide projection thereof, the method comprising the steps of:

preparing a jig having a pair of positioning holes provided such that the first and second guide projections of said ferrule can be inserted therein;

receiving light passing through the pair of positioning holes of said jig to determine the positions of the positioning holes of said jig based on the received light;

inserting the first and second guide projections into the positioning holes;

receiving light passing through the fiber accommodating hole and determining positions of the fiber accommodating hole based on the received light; and

inspecting the position of the fiber accommodating hole with respect to the first and second guide projections based on the determined positions of the fiber accommodating hole and the positioning holes.

26. (Amended) A method of inspecting a position of a fiber accommodating hole of [said] an optical connector ferrule comprising:

a mating surface made of resin;

an optical fiber accommodating hole having an inner surface and one end portion, said inner surface extending along a predetermined axis and being made of the resin, and one end portion reaching said mating surface;

a first guide projection having proximal and distal end portions, said first guide projection continuously extending from said mating surface along the predetermined axis, and said first guide projection being made of the resin; and

a guide engaging portion continuously extending from said mating surface along the predetermined axis, said guide engaging portion made of the resin, wherein said guide engaging portion includes a guide hole having an opening portion, a distal end portion, and an inner surface, said opening portion being provided on said mating surface, said inner surface being made of the resin, and said guide hole extending along the predetermined axis, [according to claim 5] with respect to the first guide projection thereof, the method comprising the steps of:

preparing a first jig having a pair of positioning holes provided such that the projections of said ferrule can be inserted therein;

receiving light passing through the pair of positioning holes of said jig to determine the positions of the positioning holes of said jig based on the received light;

preparing a second jig having a positioning projection provided so as to be inserted into the first guide hole of said ferrule to insert the positioning projection of said second jig into one of the pair of positioning holes;

inserting the first guide projection of said ferrule into the other of the pair of positioning holes, and inserting the positioning projection into the guide hole of said ferrule;

receiving light passing through the fiber accommodating hole to determine a position of the fiber accommodating hole based on the received light; and

inspecting the position of the fiber accommodating hole with respect to the first guide projection and the guide hole based on the determined positions of the positioning hole and the fiber accommodating hole.

REMARKS

Entry of the present Amendment and Remarks, prior to initial examination, is respectfully solicited. The present Amendment cancels claims 1 through 14, places claims 15, 16, 17, 25 and 26 in independent form, and corrects the dependency of claims 18, 20 and 21. The present Amendment also incorporates the preliminary amendments as filed in parent application Serial No. 09/509,953.

Respectfully submitted,

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